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ABSTRACT

This paper presents a new research instrument, The Lifetime Creativity Scales (LCS), along with validation evidence based on two large and independent samples. Views on creativity are discussed, the background of the LCS is reviewed, and the LCS are briefly described. The seven scales--three measuring peak creativity, three measuring extent of creative involvement, and one summarizing overall creativity--are explained. The data base and data preparation for the validation studies, all involving subjects from Danish adoption studies, are presented. A summary of descriptive and validation data includes sections on interrater reliability, descriptive statistics and interrelationships, and validity. The LCS are described as providing broad-based assessment of innovative activity at work and leisure, without the requirement that activities be socially recognized or limited to particular fields of endeavor, and as allowing for study of real-life creativity in general populations. It is noted that the scales show high interrater reliability and multiple indications of construct validity. Findings with the validation samples are presented which raise interesting questions involving the relationship between vocational and avocational creativity, and equality of vocational opportunity for men and women. (Author/NB)

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# Assessing Creativity at Work and Leisure: The Lifetime Creativity Scales

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## Abstract

A new research instrument, "The Lifetime Creativity Scales" (LCS) is presented along with validation evidence based on two large and independent samples. The LCS provides broad-based assessment of innovative activity at work and leisure, without the requirement that activities be socially recognized or limited to particular fields of endeavor. The LCS therefore allows study of real-life creativity in general populations. The scales show high interrater reliability and multiple indications of construct validity. Findings with the validation samples raise interesting questions involving the relationship between vocational and avocational creativity, and equality of vocational opportunity for men and women.

The term "creative" is applied popularly to accomplishments which are original in nature, rather than imitative of other accomplishments. Beyond this, however, usage varies greatly. Some would reserve the term for only a handful of individuals throughout all history--individuals such as Beethoven or Einstein, whose achievements are viewed as standing in a class by themselves. Alternatively, a broader group of "creatives" may be identified, for instance individuals whose achievements lie in the more traditionally creative areas of the arts or sciences. Or the term may be applied to the general population, with every member possessing creativity to a greater or lesser extent as manifested through a wide variety of outcomes that need not be constrained to specific fields of endeavor.

We adopt this last view for our measurement of creativity. The view at once bears similarities to the views on creativity of humanistic psychologists such as Maslow (1959) and Rogers (1959) and to the concept of "phenotypic plasticity" underlying human inventiveness and adaptability described by evolutionary biologists such as Dobzhansky and Montagu (1947; also see Dobzhansky, 1962).

That creativity may involve some common elements across varied enterprises is supported by empirical evidence for a general "disposition toward originality" (Barron, 1955, 1969) and for "core" characteristics of the individual which are associated with creativity, assessed by different criteria, across diverse endeavors (Barron & Harrington, 1981; Cattell, Eber, & Tatsuoka, 1970). This position is consistent with the presence of special abilities and skills which may also facilitate creativity in

particular fields such as art, music, or mathematics (Barron & Harrington, 1981; Gardner, 1983). Some general characteristics--for instance, those associated with the construct of "intelligence"--may play a role as well (Barron, 1969; Richards, 1976, 1981).

## Lifetime Creativity Scales: Background

The Lifetime Creativity Scales (LCS) were originally developed to compare aspects of creativity in psychiatric and normal samples (e.g., Richards, Kinney, Lunde, Benet, & Merzel, 1985; for reviews of research on creativity and psychopathology, see Andreasen, 1978; and Richards, 1981). Broad-based assessment of real-life creativity--the present focus--had already proven valuable in genetic studies of creativity and psychopathology (Heston, 1966; McNeil, 1970; Richards et al., 1985). For our purposes, it was essential to be able to characterize and compare all subjects in our samples on the level of originality displayed in their adult activities, whatever their particular interests or fields of endeavor.

Formal measures of creative accomplishment (e.g., Holland & Nichols, 1964; Wing & Wallach, 1971) either tend to focus on specific areas such as the arts, science, and leadership, or require some degree of social recognition (e.g., through citations or special awards) for identification of creativity. We chose not to use the available indirect or inferred measures of creativity (e.g., measures of specific attitudes, personality traits, or brief psychometric "ability" measures) because of

evident problems of reliability and validity (Treffinger, Renzulli, & Feldhusen, 1971; Treffinger & Poggio, 1972; Hocevar, 1981).

There are precedents for the LCS in previous research on creativity and psychopathology (Heston, 1966; McNeil, 1971; Andreasen & Canter, 1978). In each study, creativity was estimated broadly in terms of vocational and avocational activity. The LCS refines this approach, extends it to encompass creative activities over the adult lifetime, and removes any requirement that activity be socially recognized. However, parameters were included for breakdown of a sample, e.g. by specific field or degree of social recognition, so that relevant patterns and questions involving these variables could also be addressed.

The focus of the LCS is on a range of real-life outcomes (products, behaviors, ideas that have been communicated). Two general criteria for creative outcomes are employed (after Barron, 1969): (a) that a new or unusual element be involved (originality criterion) and (b) that the outcomes be meaningful to others (criterion of adaptation to reality). Vocational and avocational creativity are considered separately, as well as together, in order to test patterns of emphasis anticipated among particular subject groups. For instance, there are suggestions (e.g., Akiskal, Hirschfeld, & Yerevanian, 1983) that subjects at risk for bipolar manic-depressive disorder may concentrate their energies disproportionately on work. In addition, there is evidence consistent with greater vocational than avocational creativity in subjects who are in fact bipolar (Richards, et al.,

1985).

## The Lifetime Creativity Scales: Characteristics and Validation

### Brief Description

The Lifetime Creativity Scales pertain to the quality and quantity of creative activity over the adult lifetime. The "lifetime" approach makes it possible to identify the maximum realization of creative potential for each subject (peak creativity). It also allows assessment of the pervasiveness of creative activity in each subject's life (extent of involvement). "Peak" scales are taken as the best real-life reflection of an underlying "disposition toward originality," whereas "extent" scales are viewed as stronger reflections of ongoing motivation for creativity in interaction with environmental conditions.

There are seven scales in total. Three of these are measures of "peak creativity" and three are measures of "extent of creative involvement" over the adult lifetime (for vocational, avocational, and for overall activity). There is also a summary measure of "overall" creativity. The "peak creativity" scales address the degree of innovativeness of "major enterprises" or ongoing areas of activity (e.g., a major sculptural work or collection, an advertising campaign) compared to more usual products or practices. "Involvement" scales assess the pervasiveness of creative vs. other activity over the lifetime. Activities must meet a minimum standard of originality to be considered "creative"; beyond this, extent of creative "involvement" is independent of quality of creativity

demonstrated. The "overall creativity" scale involves a lifetime integration of information involving the quality and extent of creative activity.

All ratings are made on six-point scales ("insignificant," "minor," "some," "moderate," "high," and "exceptional" peak creativity/extent of involvement/overall creativity), where the third rating level (e.g., "some" creativity or involvement) is taken as a normative average. A rating guide provides specific criteria for each rating level along with multiple examples for each type of scale. Criteria for peak creativity and for extent of involvement are found in Table 1.

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Insert Table 1 about here

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## Data Base and Data Preparation

Data for assessment of creativity may be best obtained through detailed personal questioning by an experienced interviewer and through direct observation of creative outcomes where possible. The present validity evidence is based primarily on data from two large and independent samples, complemented by information on a small third sample. The first sample is an interviewed group of biological and adoptive index and control relatives from a Danish adoption study of affective disorder (Wender et al., in preparation). The other two samples are drawn from the biological and adoptive control relatives from two Danish adoption studies of schizophrenia, the Copenhagen Adoption Study (Kety et al., 1978) and the Danish Provincial Adoption

Study, its ongoing continuation. We will refer to these samples as the Affective Disorder Sample (174 subjects), Copenhagen Control Sample (185 control subjects), and the Danish Provincial Sample (from which a subsample of ten subjects was selected for an interrater reliability determination).

For the first two samples, there was minimal respondent or interviewer bias since creativity was not a focus at the time. However, the data on vocational and avocational history was not always as complete as it could have been in a focused creativity study. Fifteen percent of the Affective Disorder Sample had insufficient data on leisure time activity and were eliminated from the avocational data analyses. Although an occupational history was provided, detailed job descriptions were lacking for most subjects in the Affective Disorder and Copenhagen Control samples. Thus, an alternative rating procedure was employed, based on detailed standard descriptions of these activities (U.S. Dept. Labor, 1977; Kolstrup, 1982) adapted to the Danish culture with the help of two consultants on Denmark. It is likely that reliability and validity findings would have been even more compelling with a more detailed data base, since creativity variables could have been assessed with even greater precision.

Written interview reports were available on all subjects in each of the three samples. Prior to assessment of creativity, these written reports were carefully edited by a person other than the rater. All potentially biasing information was masked or removed, including references to positive or negative aspects of personality, intellectual ability, personal and family history

of psychopathology, data on personal growth and development, environmental stressors, and any other material that might bias the rater.

## Summary of Descriptive and Validation Data

### Interrater Reliability

Following an intensive training procedure, three raters rated ten protocols from both the Affective Disorder and the Danish Provincial Samples. Results were quite good in each case. Considering all relevant coefficients together, the mean reliability for vocational creativity measures was 0.81 (SD=.13), for avocational measures was 0.90 (SD=.09), and for overall measures was 0.94 (SD=.02). These determinations were based on 12. 12. and 18 coefficients respectively.

### Descriptive Statistics and Interrelationships

Distributions of creativity variables were approximately normal for each sample. This was anticipated because of the (a) broad prevalence of creativity, as defined, in the population and (b) the norm-referenced nature of the assessments which, in effect, rescales any further departure from normality. Descriptive statistics are given in Table 2 for the seven LCS scales along with additional measures used for validation purposes. The similarity of LCS means and standard deviations across these two different samples is of interest.

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Insert Table 2 about here

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Interrelationships between these variables are shown in

Table 3 for both samples (using all possible subjects for each

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Insert Table 3 about here

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pair of variables). Vocational "peak creativity" and "extent of creativity" measures were highly correlated for both samples, as were the corresponding two avocational measures, and overall measures. Interestingly, however, vocational and avocational variables showed very little relationship to each other, while all component variables showed moderate or stronger relationships to the summary variables. Comparing the two samples, "peak creativity" and "extent" variables were not quite as strongly related in the Copenhagen control as in the affective sample, while the relationship between vocational and avocational variables was moderately low rather than insignificant.

Validity

Several lines of validity evidence for the LCS will be presented.

Content validity. This type of sampling validity is directly related to the completeness of the data base on vocational and avocational activity, since the measures themselves can be applied to a wide range of endeavors.

Construct validity: Factor analyses of creativity and other variables for the Affective Disorder Sample. Three documented predictors of adult creativity, "childhood creativity," "fantasy," and "appreciation of creativity" (see Getzels & Jackson, 1962; Schaefer & Anastasi, 1968; Wallach,

1970; Davis & Rimm, 1977; Barron & Harrington, 1981), were rated for all subjects in the affective sample with sufficient data to permit this (the N's are given in Table 2), and their relationship to the LCS scales was determined.

Childhood creativity was rated on a six-point scale, using the present criteria for "overall creativity." Both fantasy and appreciation of creativity were rated on three-point scales (low, intermediate, high). Information on fantasy during the adult years was specifically elicited in the interview; the rating pertained to the overall frequency of fantasy production. "Appreciation" was assessed from information on subjects' more passive leisure activity, with emphasis on "attraction as a spectator or consumer" to more traditionally creative endeavors in the arts and sciences; ratings reflect amount of involvement and level of initiative in pursuing such activity.

In addition, educational level was recorded for the affective sample, along with an estimate of intelligence (below average, average, above average) based on the interviewer's mental status exam. Both education and intelligence may enhance the realization of creative potential; thus, positive correlations are expected. Yet these variables should nonetheless stand apart from measures of creativity. In fact, formal intelligence measures tend to show low-positive correlations with measures of creativity (Wallach, 1970; Barron & Harrington, 1981). Unfortunately, subjective ratings of intelligence such as the present one can be influenced by observed creativity (Barron & Harrington, 1981), potentially inflating the magnitude of intelligence-creativity correlations.

Results of a principal components factor analysis followed by Varimax rotation is shown in Table 4. (After obtaining a two-factor solution based on factors with eigenvalues greater than one (Harman, 1967), a third factor was allowed for descriptive

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Insert Table 4 about here

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purposes.) Factors are defined by measures of (I) avocational creativity, (II) vocational creativity, and (III) the intelligence measure.

General intelligence thus appears to stand apart from creativity. Interestingly, although education and intelligence show low-positive loadings on Factor II, vocational creativity, they show very little relationship to Factor I, i.e., to avocational creativity. The predictors of creativity are relevant to both of the creativity factors (I and II), and explain more variance between them than they do with the intelligence factor.

Construct validity: Factor analyses of creativity and other variables for the Copenhagen Control Sample. This factor analysis shows many similarities to the previous one. Included are the seven LCS measures, appreciation of creativity, educational level and the intelligence rating, and a measure of adult family socioeconomic status (SES). SES was estimated using a Danish scale (Svalastoga, 1959) which has been employed in research on Danish subjects (e.g., Kety et al., 1978).

A principal components factor analysis followed by a varimax rotation is shown in Table 5. (In this case, following a three

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Insert Table 5 about here

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factor solution based on factors with eigenvalues greater than one, a fourth factor was allowed for descriptive purposes.) Once again, there are factors defined by measures of (I) vocational creativity, (II) avocational creativity, and (IV) the intelligence estimate, along with appreciation of creativity. The association of the "appreciation" measure with intelligence for this sample may highlight the relatively academic nature of this predictor, and the fundamental distinction between the active generation of creative products and the passive appreciation of others' efforts.

There is also an interesting new factor (III) in this analysis, defined by educational level and SES. (Without SES, education was unable to define its own factor in the preceding factor analysis.) Among LCS scales, vocational extent of creativity showed the strongest loading on this new, fourth factor.

In summary, the results of the two factor analyses: (a) further characterized the LCS and their underlying dimensionality across two different samples, a psychiatric sample and a normal control sample; (b) showed the distinctness of the LCS from control variables such as education, intelligence, and SES (while indicating a low to moderate degree of relationship with these, as expected), and (c) indicated the particular relevance of some predictors of adult creativity to factors defined by the LCS.

Construct validity: Interest styles and creativity. Holland (1966, 1973) has identified six primary interest styles; he ranks these in descending order by the typical level of creativity shown as follows: artistic, investigative, social, enterprising, realistic, and conventional. This ordering appears intuitively reasonable. Although a "conventional" job (e.g., filing clerk) might be performed creatively by some people, it would typically be performed in a routine way. An "artistic" job (e.g., sculptor) might be performed according to a proscribed and routine format but would usually tend, by its very definition, to elicit some degree of originality.

Holland and associates have equated a variety of occupations with each interest style. We took a representative listing of these jobs (see Holland, 1973) and rated the corresponding job descriptions (U.S. Dept. Labor, 1977) for vocational creativity by our method. The six interest style categories were then rank-ordered, based on the mean creativity involved. The resultant order was identical to that of Holland, representing a perfect rank-order correlation of 1.00.

Each subject in the Copenhagen control sample had been assigned a primary interest style corresponding to the most creative job. These styles were then assigned a creativity score from six to one, based on the above ordering, and their correlation with vocational peak creativity was determined, using the Kendall rank-order coefficient. Their correlation with three control variables—education, SES, and intelligence—was determined as well. In fact, interest style correlated 0.56 with vocational peak creativity and only 0.16, 0.21, and 0.25,

respectively, with the three control variables.

## Discussion

While further work is required, there are multiple indications that The Lifetime Creativity Scales measure characteristics relevant to the construct of creativity. For the two different samples studied, the vocational and avocational "peak creativity" scales appear to provide a good summary of the data. The "overall creativity" scale could nonetheless be useful for testing general group differences across the varied manifestations of creativity at work and leisure. The "extent of involvement" scales might also be useful for certain research or applied purposes. There is a demonstrated tendency for quantity and quality of creativity to vary together (Wallach, 1970; Richards, 1976; Simonton, 1977) as was found here, although any systematic assessment bias should be fully excluded.

The relative independence of the vocational and avocational creativity scales is intriguing, and suggests several possible interpretations. In an analysis of 77 index and control subjects from the present sample (Richards et al., 1985) we found that "moderate" or higher creativity at leisure occurred almost entirely in the arts and crafts in each group. (Such activity tends to be emphasized in Denmark.) Activities involving visual content were approximately as popular as those involving language, music, and movement combined. By contrast, creativity at work was more broadly distributed between the arts, sciences, humanities and social sciences, and organizational and leadership

roles.

Perhaps our findings reflect a fundamental difference between creativity in the arts and crafts and creativity in the other areas just described. The possibility is perhaps supported by the relative independence of avocational (vs. vocational) creativity scales from measures of education and intelligence for the affective disorder sample. Alternatively, findings may reflect peculiarities of this data set (e.g., the use of alternative vocational ratings based on standard job descriptions). Another possibility is that creative activities at home and leisure--where fewer external structures, rewards, or constraints may prevail--may attract a different kind of person than do vocational creative activities.

In this context, we note a significant difference favoring men on vocational creativity, whereas no significant sex effect was found on measures of avocational creativity (Richards et al., 1985). The lack of sex differences for avocational creative activity may, as one explanation, reflect a relatively greater equality of opportunity for training and accomplishment at leisure than at work.

The Lifetime Creativity Scales provide a new and more systematic way of studying real-life creativity in general populations and could open up new avenues of creativity research. The authors will make the LCS available to interested professionals for research purposes.

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## Author Notes

A preliminary report on the Lifetime Creativity Scales was presented at the 138th annual meeting of the American Psychiatric Association, Dallas, Texas, May, 1985. The present report is an extension of a paper presented at the 93rd annual meeting of the American Psychological Association, Los Angeles, California, August, 1985. The authors are grateful to Drs. Seymour Kety, David Rosenthal, Paul Wender, and Fini Schulsinger for permission to use the present samples and interview data base for this research, and to the Spencer Foundation for its support of the refinement and validation of The Lifetime Creativity Scales. Sincere thanks are also extended to Karen Dahlman, Lisa Dekeon, Beth Gerstels, Mary Ann Kotch, Neil Kudler, Carol Paik, Peter Rogers, Karen Spritzer, Christine Stanowski, Kent Stallard, Heather Walker, and Anna Wexler for their assistance in various aspects of this creativity research project.

Table 1

Definitions of Levels of Two Types of Creativity Scales

| Levels for Peak Creativity |
|---|
| (0)--"No Significant": Routine or proscribed endeavors with negligible innovative aspects. |
| (1)--"Minor Degree": Small unexceptional departures from routine or proscribed endeavor. |
| (2)--"Some": Greater innovativeness, but not unusual in the population. |
| (3)--"Moderate": Presence of central innovative elements which stand out in the population, although not markedly; these may involve major modifications of common practices or products. |
| (4)--"High": Presence of markedly distinctive innovative elements which set endeavors well apart from others in the population. |
| (5)--"Exceptional": Radical departures from the commonplace; these may require conceptual reorganization to be assimilated. |
| **Levels for Extent of Creative Involvement** |
| (0)--"No Significant": Highly proscribed or routine patterns of |

lifetime activity.

(1)--"Minor Degree": Proscribed or routine patterns, broken by brief, rare instances of innovative activity.

(2)--"Some": Greater extent of innovative activity than above, but not unusual in the population, and other activity tends to predominate.

(3)--"Moderate": Notable innovative activity in a pattern that tends to admix this with other forms of endeavor.

(4)--"High": Markedly distinctive emphasis on innovation--a dominant life theme and primary commitment.

(5)--"Exceptional": Intense, pervasive, and perhaps compulsive preoccupation with innovative activity over time, to the virtual exclusion of other emphases.

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Table 2

Descriptive Statistics for The Lifetime Creativity Scales and Selected Other Measures for Two Independent Samples

| Measure | Affective disorder Ss | | | Copenhagen control Ss | | |
|---|---|---|---|---|---|---|
| | N | Mean | S.D. | N | Mean | S.D. |
| **The Lifetime Creativity Scales** | | | | | | |
| Voc. Peak Creativity | 175 | 1.89 | .95 | 179 | 1.77 | .89 |
| Voc. Extent of Creat. | 173 | 1.75 | 1.09 | 177 | 1.67 | 1.06 |
| Avoc. Peak Creativity | 149 | 1.68 | 1.14 | 183 | 1.78 | .76 |
| Avoc. Extent of Creat. | 147 | 1.90 | 1.28 | 182 | 1.90 | .95 |
| Overall Peak Creativ. | 175 | 2.26 | .89 | 178 | 2.08 | .75 |
| Overall Extent of Creat. | 172 | 2.04 | 1.01 | 178 | 1.87 | .90 |
| Overall Creativity | 172 | 2.00 | .97 | 178 | 1.95 | .93 |
| **Selected Measures of Relevance to Adult Creativity** | | | | | | |
| Childhood Creativity | 120 | 1.52 | 1.16 | | | |
| Fantasy | 124 | .80 | .93 | | | |
| Appreciation of Creativ. | 123 | .82 | .71 | 179 | .70 | .75 |
| Soc. Recognition, Creat. | | | | 180 | .12 | .39 |
| Status, Most Creat. Job | | | | 178 | 41.6 | 20.4 |
| **Education, Intelligence, and Socioeconomic Status** | | | | | | |
| Educational Level[a] | 172 | 9.03 | 2.92 | 185 | 8.62 | 2.72 |
| Intelligence Rating[b] | 170 | 1.08 | .44 | 185 | 2.19 | .63 |
| Socioeconomic Status | | | | 176 | 2.29 | 1.85 |

[a] Truncated above 18 yrs to eliminate undue influence of extreme values.

[b] Three- and five-point scales respectively were employed (0-2, and 1-5).

Table 3

Intercorrelations Between the Lifetime Creativity Scales and Selected Other Measures for Two Independent Samples

| | Measures | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | A1 | A2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Voc. Peak Creativity | | 85 | 13 | 18 | 71 | 61 | 63 | 40 | 39 | 33 | 44 | 34 |
| 2 | Voc. Extent of Creat. | 81 | | 23 | 25 | 64 | 68 | 70 | 38 | 42 | 30 | 46 | 36 |
| 3 | Avoc. Peak Creativity | 46 | 43 | | 92 | 63 | 67 | 66 | -03 | 19 | 23 | 43 | 33 |
| 4 | Avoc. Extent of Creat. | 44 | 44 | 78 | | 57 | 68 | 66 | 08 | 15 | 21 | 45 | 32 |
| 5 | Overall Peak Creativ. | 81 | 67 | 75 | 61 | | 83 | 86 | 30 | 40 | 39 | 52 | 44 |
| 6 | Overall Ext. of Creat. | 67 | 78 | 68 | 71 | 77 | | 93 | 31 | 37 | 36 | 55 | 41 |
| 7 | Overall Creativity | 74 | 78 | 67 | 70 | 84 | 90 | | 30 | 39 | 37 | 51 | 39 |
| 8 | Educational Level | 32 | 34 | 24 | 27 | 36 | 36 | 36 | | 34 | 15 | 25 | 16 |
| 9 | Intelligence Rating | 39 | 34 | 38 | 38 | 44 | 38 | 37 | 38 | | 31 | 33 | 30 |
| 10 | Apprec. of Creat. | 24 | 18 | 30 | 30 | 30 | 29 | 27 | 30 | 37 | | 21 | 23 |
| B1[b] | Socioeconomic Status | 35 | 44 | 32 | 30 | 39 | 47 | 46 | 40 | 24 | 09 | | -34 |

[a] Values above the diagonal are for the affective disorder sample and below the diagonal for the Copenhagen control sample. Decimal points are omitted for all figures.

[b] Measures labeled A1 and A2 were available for the affective disorder sample only, and B1 for the Copenhagen control sample only. (A1 = childhood creativity, A2 = fantasy)

Table 4

Factor Analysis Indicating the Dimensionality of the LCS Scales and Their Relationship to Selected Other Measures for the Affective Disorder Sample [a]

| | Measures | Factors | | | $h^2$ |
|---|---|---|---|---|---|
| | | I | II | III | |
| 1 | Voc. Peak Creativity | | 89 | (28) | 88 |
| 2 | Voc. Extent of Creat. | | 82 | 30 | 79 |
| 3 | Avoc. Peak Creativity | 98 | | | 98 |
| 4 | Avoc. Extent of Creat. | 91 | | | 84 |
| 5 | Overall Peak Creativ. | 59 | 62 | (28) | 81 |
| 6 | Overall Extent of Creat. | 68 | 59 | (23) | 87 |
| 7 | Overall Creativity | 67 | 61 | (23) | 87 |
| 8 | Childhood Creativity | 40 | 35 | (29) | 37 |
| 9 | Appreciation of Creat. | (21) | (24) | (29) | 19 |
| 10 | Fantasy | 31 | (26) | (29) | 24 |
| 11 | Educational Level | | 34 | 35 | 24 |
| 12 | Intelligence Rating | | (21) | 76 | 63 |

[a] Only loadings > .20 are reported; loadings between .20 and .29 are indicated in parentheses. Decimal points are omitted for all figures.

Table 5

Factor Analysis Indicating Major Creativity Scales Are Distinct from Other Variables in an Independent Nonpsychiatric Validation Sample

| Measures | Factors | | | | $h^2$ |
|---|---|---|---|---|---|
| | I | II | III | IV | |
| 1. Vocational Peak Creativity | 89 | | | (27) | 91 |
| 2. Vocational Extent of Creativity | 78 | (25) | 35 | | 81 |
| 3. Avocational Peak Creativity | (25) | 81 | | (28) | 80 |
| 4. Avocational Extent of Creativity | (21) | 78 | | (26) | 75 |
| 5. Overall Peak Creativity | 65 | 53 | | 32 | 82 |
| 6. Overall Extent of Creativity | 57 | 62 | 36 | | 87 |
| 7. Overall Creativity | 65 | 60 | 32 | | 90 |
| 8. Intelligence Rating | (23) | (21) | | 51 | 49 |
| 9. Educational Level | | | 58 | 39 | 38 |
| 10. Socioeconomic Status | (25) | (20) | 55 | | 42 |
| 11. Appreciation of Creativity | | | | 56 | 35 |

Note: Principal components solution with varimax rotation, using 185 control subjects from an independent adoption study of schizophrenia. Only loadings >.20 are reported, loadings between .20 and .29 are indicated in parentheses. Decimal points are omitted for all figures.